

**DRILLING HEAD WITH PROTECTIVE SCREEN**

DESCRIPTION

The present patent concerns earth drilling machines with extraction of the drilled material by means of pressurised air/water flow with outer sleeve, and in particular it concerns the discharge of the drilled material and the extraction air/water.

Drilling machines are known, which are designed to obtain vertical or horizontal holes in the ground.

Said machines are provided with a drill head which, by means of the driver under the head, drives the drill rod and the outer tube also called sleeve.

The drill rod is rotated by a motor and is pushed downwards by a translation mechanism called head carriage.

In particular, the drill rod is hollow and permits the passage of air and/or water pumped under pressure inside said rod, thus obtaining drainage of the ground drilled.

As a result of the pressure received from the compressor or a water pump, the air/water and the earth drilled rise to the surface between said drill rod and said sleeve and are then discharged from their upper aperture, i.e. between the inner driver and the outer driver.

The upper aperture of the sleeve fixed to the driver, from which the drilling air/water is discharged together with the earth drilled, is located near the rotation head, which moves down along the slide by means of the head carriage.

During drilling the head, and therefore the drivers, are in an elevated position with respect to the ground.

The air/water under pressure and the earth drilled are discharged from the upper aperture, between the inner driver and the outer driver, spraying everything around, flooding and dirtying nearby machinery and the surrounding area (which is a nuisance if near boundaries or other constructions), soaking and dirtying the persons

passing by the drilling machine.

To remedy all the above-mentioned drawbacks, a new drill head provided with protective screen has been designed and implemented.

The aim of the new head with screen is to contain the jet of air/water and earth drilled.

A further aim of the new head with screen is to convey the jet of water and earth drilled in a pre-set direction or area.

A further aim of the new head with screen is to prevent, or in any case considerably limit, dispersion of the air/water and earth drilled in the area surrounding the drilling machine.

A further aim of the new head with screen is to prevent accidents to persons caused by the spreading of the air/water and earth drilled in the areas surrounding the drilling machine.

These and other aims, direct and complementary, are achieved by the new drill head provided with protective screen comprising at least two connection and adjustment supports and a screen panel.

The connection and adjustment supports are applied to the drill head motor, while the screen panel is applied and connected to said supports.

The connection between panel and supports is such as to permit the adjustment of the position of said panel on said supports, both laterally, moving it away from or near to the drill rod, and parallel to the drill rod, thus covering or exposing the area of the driver apertures.

Said panel of the new screen conveys the water and the earth that are drilled and discharged between the inner driver and the outer driver to a circumscribed or in any case controlled area.

During drilling the screen is lowered to the height of the driver apertures, while for maintenance the screen is raised with respect to the apertures of said drivers.

Appropriate mechanical-electrical-hydraulic devices provide for translation of the screen parallel to the drill rod.

The characteristics of the new drill head with protective screen will be illustrated in greater detail in the following description, making reference to the drawings attached  
5 as a non-limiting example.

Figure 1 is a view of the head with the motor (M) of the drill rod to which the plates (P) and the screen panel (S) are applied.

Figure 2 is a side/front view of the invention applied to the drill head.

Substantially, the rotating shaft (B), housed in and fixed to the drill head, is screw-  
10 connected to the inner driver (T1) of the drill rod (A). The inner driver (T1) is connected to the outer driver (T2) of the drill sleeve (C).

The protective screen comprises at least two connection supports (P), which can be applied to the drill head, and a screen panel (S).

Each of said connection supports (P) is provided with at least one pneumatic-  
15 hydraulic piston or other translation device (Pa) for application, fixing and adjustment of the screen panel (S).

Said translation device (Pa) is positioned parallel to the axis of the shaft (B), or parallel to the drill rod (A) and to the sleeve (C).

The screen panel (S) basically consists of a generically U-shaped metal sheet (Sl), in  
20 one single element or several elements, or in any case bent and shaped in order to cover and envelop the drivers (T1, T2) and the rotation shaft (B) on three sides.

The inner part of the metal sheet (Sl) is provided with connection elements (Sa) for application, connection and adjustment to the translation devices (Pa) of the connection supports (P).

25 The screen panel (S) is applied to said translation devices (Pa) of said connection supports (P) in order to envelop and cover the shaft (B) and the drivers (T1, T2) on at least three sides.

During connection and disconnection of the head to/from the drill rod (A) and the sleeve (C), the translation devices (Pa) of the protective screen keep the screen panel (S) raised (position shown in figure 2) for easy access to the parts to be connected.

Throughout the drilling operation, said translation devices (Pa) move the screen panel (S) downwards or towards the drill tip (figure 2, position shown by a broken line), thus aligning it with and covering the gap between drill rod (A) and the sleeve (C) where the air/water and earth drilled are discharged.

The water and earth drilled that are discharged from the sleeve (C) encounter the screen panel (S) which retains them and conveys them to the base of the drill rod or towards a pre-set point/direction.

The connection devices (Sa) of the screen panel (S) permit adjustment of the position and angle-direction of said screen panel (S) according to the specific position of the drill rod and the items present in the area around the drilling site.

Therefore, with reference to the preceding description and the attached drawings, the following claims are expressed.